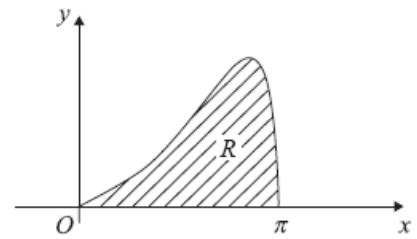


1. The curve shown in the diagram has equation $e^x \sqrt{\sin x}$, $0 \leq x \leq \pi$. The finite region R bounded by the curve and the x -axis is shown shaded in Figure 1.



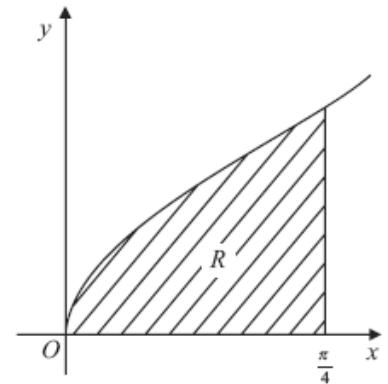
- (a) Copy and complete the table below with the values of y corresponding to $x = \frac{\pi}{4}$ and $x = \frac{\pi}{2}$, giving your answers to 5 decimal places.

x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π
y	0			8.87207	0

(2)

- (b) Use the trapezium rule, with all the values in the completed table, to obtain an estimate for the area of the region R . Give your answer to 4 decimal places. (4)

2. The diagram shows part of the curve with equation $y = \sqrt{\tan x}$. The finite region R , which is bounded by the curve, the x -axis and the line $x = \frac{\pi}{4}$, is shown shaded in the diagram.



- (a) Given that $y = \sqrt{\tan x}$, copy and complete the table with the values of y corresponding to $x = \frac{\pi}{16}$, $\frac{\pi}{8}$ and $\frac{3\pi}{16}$, giving your answers to 5 decimal places.

x	0	$\frac{\pi}{16}$	$\frac{\pi}{8}$	$\frac{3\pi}{16}$	$\frac{\pi}{4}$
y	0				1

(3)

- (b) Use the trapezium rule with all the values of y in the completed table to obtain an estimate for the area of the shaded region R , giving your answer to 4 decimal places. (4)
The region R is rotated through 2π radians around the x -axis to generate a solid of revolution.

- (c) Use integration to find an exact value for the volume of the solid generated. (use the formula $V = \int \pi y^2 dx$) (4)

Answers

1a) 1.84432, 4.81048

1b) 12.1948

2a) 0.44600, 0.64359, 0.81742

b) 0.4726

c) $\pi \ln \sqrt{2}$